

A REVIEW OF DEATHS OCCURRED DUE TO H1N1 INFECTION IN HOSPITALS ATTACHED WITH SN MEDICAL COLLEGE, JODHPUR

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DOI: 10.5455/ijmsph.2013.070520131

Received Date: 14.04.2013

Accepted Date: 07.05.2013

ABSTRACT

Background: H1N1 infection is a viral infection and it is communicable from an infected person to the susceptible contacts. A large number of H1N1 cases and deaths had been reported in districts of western Rajasthan during the pandemic of H1N1 influenza in the year 2009-10. In 2012-2013 also, Influenza 'A' H1N1 virus once again has reappeared in western Rajasthan.

Aims & Objective: To review deaths due to H1N1 Positive patients in Hospitals attached with Medical College.

Material and Methods: The present study was a hospital based study. The study was conducted by taking information from H1N1 positive patients and their relatives from Umed, M.G., M.D.M., and Chest & T. B. Hospitals of Jodhpur from 1st January, 2012 to 20th March, 2013. During our study period, 1877 samples were collected from the suspected Outdoor and Indoor patients of hospitals. The collected samples were transported in VTM (viral Transport Media) to the testing Laboratories of Medical College/ Desert Medicine Research Centre (DMRC), Jodhpur and subjected to RT-PCR technique for the detection of H1N1 Influenza virus.

Results: Out of 1877 samples collected during our study period, 375 samples were found positive. The study shows an H1N1 case positivity rate of 19.97%. During the study period, 68 patients died of H1 N1 infection with a Case fatality rate of 18.13%. Out of 68 H1N1 positive patients' deaths, deaths were more (45; 66.16%) in female than in male (23; 33.82%). Out of 45 women who died of H1N1 infection, 33.82% (23) of the women were pregnant. The study also reveals a higher incidence of H1N1 infection and mortality in younger age group.

Conclusion: The Influenza A (H1N1) virus is still present two years after year 2009-10 pandemic. It has become a ubiquitous virus in the districts of Western Rajasthan region of India. In the event of new influenza outbreaks, hygienic and containment measures must be quickly and correctly implemented in order to avoid an epidemic.

KEY-WORDS: Influenza A; H1N1; Viral Transport Media (VTM); Real-Time Polymerase Chain Reaction (RT-PCR)

Introduction

Swine flu (swine influenza) is a respiratory disease caused by viruses (influenza viruses) that infect the respiratory tract of pigs, resulting in nasal secretions, a barking cough, decreased appetite, and listless behaviour.^[1] Swine flu produces most of the same symptoms in pigs as human flu produces in people. Swine flu can last for about one to two weeks in pigs that survive. Swine influenza virus was first isolated from pigs in 1930 in the U.S. and was recognized by pork producers and veterinarians to cause infections in pigs worldwide. In a number of instances, people have developed the swine flu infection when they are closely associated with pigs (for example, farmers, pork processors), and likewise, pig population have occasionally been infected with

the human flu infection. In most instances, the cross-species infections (swine virus to man; human flu virus to pigs) have remained in local areas and have not caused national or worldwide infections in either pigs or human beings. Unfortunately, this cross-species situation with influenza viruses had the potential to change. In the present century, the first case of H1N1 (swine flu) was diagnosed in Mexico in USA on April 15, 2009.^[1] First case seen in Mexico, it is termed as novel H1N1 flu since it is mainly found infecting people and exhibits two main surface antigens, H1 (hemagglutinin type 1) and N1 (neuraminidase type 1). Recent investigations show that eight RNA strands from novel H1N1 flu have one strand derived from human flu strains, two from avian (bird) strains, and five from swine strains. Swine flu is transmitted from person to person by

inhalation or ingestion of droplets containing virus from people sneezing or coughing; it is not transmitted by eating cooked pork products. After its first appearance in 2009, the H1N1 virus is still causing morbidity and mortality including in state of Rajasthan.

The present study was undertaken to review deaths of H1N1 Positive patients in Hospitals attached with SN Medical College, Jodhpur.

Materials and Methods

The Present study has been conducted by taking information from H1N1 suspected and confirmed patients and their relatives and from Umed, M.G., M.D.M., and Chest & T. B. Hospitals from Jodhpur from 1st January, 2012 to 20th March, 2013. During our study, 1877 samples were collected from the suspected Outdoor and Indoor patients from Hospitals attached with Medical College. The collected samples were transported in VTM (viral Transport Media) to the testing Laboratory in Medical College/ Desert Medicine Research Centre (DMRC), Jodhpur and subjected to RT-PCR technique for the detection of H1N1 Influenza virus. Information has also been sought from Department of Microbiology and DMRC, Jodhpur. Information has also been taken from H1 N1 (Swine Flu Control Room). Permission of the appropriate authority of the college has been taken for conducting study. The Collected data were analyzed using SPSS software.

Results

During our study period from 1st January, 2012 to 20th March, 2013, total 1877 samples were collected from the suspected OPD and Indoor patients from hospitals attached with Medical College, out of which, 375 samples were found to be to be positive. The study shows an H1 N1 case positivity rate of 19.97%. During the study period 68 patients died of H1N1 infection, with Case fatality rate of 18.13% (Table 1). Out of 68 H1N1 positive patients' deaths, Deaths were more (45; 66.16%) in female than in male (23; 33.82%). Out of the 45 women who have died of H1N1 infection, 25 (36.76%) women were pregnant (23) and postpartum (2) women (Table 2). In 2012, out of 174 H1N1 positive patients, 23 died due to Swine

Flu whereas in 2013, out of 201 H1N1 positive patients, 45 died due to H1N1 Infection. The overall case fatality rate was 18.13 with a case fatality rate of 13.21 in year 2012 and 22.38 in year 2013 (Table 3). It is observed that the H1 N1 deaths were lowest (3; 4.41%) in the younger age group (0-9 years' age group) and the highest number of deaths (24; 35.29%) were observed in the 20-29 years' age group (Table 4).

Table-1: Deaths occurred due to H1N1 Infection

| Hospital | No. of Samples | Positive | Deaths |
|--------------|----------------|------------|-----------|
| M. D. M. | 992 | 219 | 49 |
| Umed | 556 | 101 | 3 |
| M.G.H. | 306 | 53 | 16 |
| Chest & TB | 23 | 2 | 0 |
| Total | 1877 | 375 | 68 |

Table-2: Sex wise Distribution of Deaths occurred due to H1N1 Infection

| Year | Total Positive Cases | Total Deaths | Deaths of Male | Deaths of Female | |
|-------|----------------------|--------------|----------------|------------------|----------------|
| | | | | Pregnant | Non Pregnant |
| 2012 | 174 | 23 | 7 | 12 | 4 |
| 2013* | 201 | 45 | 16 | 13 | 16 |
| Total | 375 | 68 | 23 (33.82%) | 25 (36.76%) | 20 (29.41%) |

* Till 20th March, 2013

Table-3: H1N1 Fatality Rate

| Year | Positive Cases | Deaths | Case Fatality Rate (%) |
|-------|----------------|--------|------------------------|
| 2012 | 174 | 23 | 13.21 |
| 2013* | 201 | 45 | 22.38 |
| Total | 375 | 68 | 18.13 |

* Till 20th March, 2013

Table-4: Age wise Distribution of Occurrence of Deaths due to H1 N1 Infection

| Age Group (In Years) | Number of Deaths | % |
|----------------------|------------------|-------|
| 0-9 | 3 | 4.41 |
| 10-19 | 5 | 7.35 |
| 20-29 | 24 | 35.29 |
| 30-39 | 12 | 17.64 |
| 40-49 | 12 | 17.64 |
| 50-59 | 6 | 8.82 |
| >60 | 6 | 8.82 |
| Total | 68 | 100% |

Discussion

In Western Rajasthan, 375 cases and 68 nos. deaths were reported during period from 1st January, 2012 to 20th March, 2013. So Case fatality ratio of Influenza A H1N1 in post pandemic phase in this study is 18.13%. This high case fatality ratio indicates that there is lack of immunity in general population and the population did not get benefit from cross protection of earlier flu epidemic.

A Puvanalingam et al in their study in two Government Hospitals in Chennai observed case fatality ratio of H1N1 was only 1.8%.^[5] Tanvir Samra et al in their Study in tertiary care hospital in Northern India reported case fatality ratio of H1N1 was 5%.^[6] High mortality in our study as compared to other regions of the country may be due that study of population restricted to a small geographical area when compared against the entire country and sick patients referred from adjacent desert parts having delay in essential medical care required with loss of crucial time for treatment.

In present study, it was observed that maximum deaths i.e. 45 nos. (66.17%) were seen in female. This is similar to that reported in other studies.^[5,7] This indicates not only a late referral but also the severity of disease being more in women, especially, in pregnant women.

Age of the patients died, varied from 3 years to 69 years, with an average age of 33.76 years. 65.0% of total cases and 35.29% of total deaths were observed in 20 to 29 years age group patients, which clearly reflect its high prevalence, morbidity and mortality among the younger population. The same observations have been made during the pandemic of year 2009 in Western Rajasthan, where the majority of the infected and sick patients were young (age <45 years) and that older population was less affected. This is also similar to that reported in other studies.^[5,8-11] In contrast, Himanshu Rana et al in their Study observed a very high H1N1 mortality in those above 45 years of age (case fatality of 26.8%).^[7]

Recent H1N1 influenza outbreak had high mortality of (45; 66.16%) in reproductive age group women and out of them 23 (33.82%) of the women were pregnant women. During prior influenza epidemics and pandemics, as well as during the pandemic of 2009, pregnant women had high morbidity and mortality.^[12] During previous influenza pandemics, increased rates of spontaneous abortion and preterm birth have been reported among pregnant women, especially in those with pneumonia.^[13] Similar to our analysis, A Puvanalingam et al in their Study in two Government Hospitals in Chennai also

observed the high case fatality (25%, 3 out of the 12 cases) among pregnant women.^[5] H1N1 influenza infection was more common in the third trimester of pregnancy (65.9%).

Recommendations

Information from the present study can be used to quantify severity and to develop mathematical models to predict how flu outbreak affects and different interventions may be taken. Knowing the different proportion of population infected in different age groups and proportion of those died will help public health decision-makers plan and respond to future pandemic. Early interventions by means of screening of the vulnerable population for influenza like illness and providing timely prophylactic antiviral drugs to the suspected persons specially to the women in reproductive age group. Hygienic measures must be strictly followed to contain the spread of the virus and perhaps to avoid an epidemic. Our experience showed that if these measures are implemented quickly and correctly, even non-vaccinated individuals are able to effectively protect themselves. To avoid new epidemics and complications preventive measures should be started at the beginning of winter season.

Future Research

Why the morbidity and mortality is higher in recent outbreak as compared to previous pandemic of the year 2009-10. Why the morbidity and mortality is higher in women especially in pregnant women needs further in-depth study.

Limitation of Study

Although patients in this study comprised a sizeable proportion of cases from Jodhpur and the adjoining districts of the Western Rajasthan, the findings of this study need to be carefully extrapolated and cannot be generalized to a large population. This is one of the limitations of our study. Secondly, we restricted our study to only hospitals; therefore, many cases of Influenza A H1N1 might have been missed. Not being a community-based study, we may not be able to calculate the exact measures of epidemiology. Thirdly, regional geographical conditions have not been accounted for, which may have a significant

impact on prevalence and morbidity. There may be a small number of cases that might have been missed, although every attempt was taken to include all the cases, but this figure would not have been significant.

Conclusion

In conclusion, the Influenza A (H1N1) virus is still present two years after year 2009-10 pandemic. In fact, it has become a ubiquitous virus in the districts of Western Rajasthan region of India. The incidence and mortality in recent outbreak of H1N1 influenza was higher in young, more during winter months. H1N1 influenza has caused severe illness and deaths in reproductive age group women; regardless of the results of testing, prompt evaluation and antiviral treatment of influenza-like illness should be considered in such women. In the event of new influenza outbreaks, hygienic and containment measures must be quickly and correctly implemented in order to avoid an epidemic.

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Cite this article as: Chauhan P, Saini G. A review of deaths occurred due to H1N1 infection in hospitals attached with SN Medical College, Jodhpur. Int J Med Sci Public Health 2013; 2:720-723.

Source of Support: Nil

Conflict of interest: None declared